

CHAPTER-V

**FINDINGS, SUMMARY,
IMPLICATIONS, SUGGESTIONS
AND CONCLUSIONS**

CHAPTER-V

FINDINGS, SUMMARY, IMPLICATIONS, SUGGESTIONS AND CONCLUSIONS

5.0.0 INTRODUCTION

The summary, implications and conclusions presented in the current chapter are based on the previous chapter. The chapter IV presented Data Analysis, Results and Interpretation of results and the related discussions are presented below under different headings in this chapter. Summary, implications and suggestions for further studies are also being part of this chapter.

5.1.0 MAJOR FINDINGS OF THE STUDY

1. The e-content for teaching Chemistry to class IX students was effective in terms of students' Achievement in Chemistry.
2. There is a significant effect of treatment on the students' achievement in Chemistry.
3. There is no significant effect of gender on the students' achievement in Chemistry.
4. There is significant interaction of treatment and gender on the students' achievement in Chemistry.
5. There is significant effect of treatment on the students' achievements in Chemistry.

5.2.0 SUMMARY

The summary of the present research is given under 5.2.1 to 5.2.9.

5.2.1 Need of The Study

Technology has significant effect on the Education system for many years. The teacher and learner must gain access to technology for improving learning outcomes. ICT aims at transferring the old traditional paradigm of learning to the new paradigm of learning. e-learning has an important role in the enhancement and development of students' critical thinking. The trend of using

e-learning as learning and teaching tool is now rapidly expanding into education. e-learning in India, is still at minimal level. Developing and validating e-content on chemistry is a novel experience. It would add electronic resources to the chemistry subject. It would create a new dimension in the field of chemistry teaching and learning. It is a progressive step towards making digital presentation of chemistry subject. This prompted the researcher to undertake a study on the effectiveness of e-content on teaching chemistry.

In class IX the basic chemistry is taught to the students & since it is an important branch of science to know the different properties of compounds in day-to-day life, the students must be studied it with that much care and interest. So, the responsibility is upon the teachers to make them understand. The pandemic situation has been continuing since one & half years there is little possibility of face-to-face transaction of knowledge. E -content that is electronic content using pictures, sound, video, audio through internet plays great role in teaching learning process of chemistry & irrespective of caste, class, religion & gender it acts as a virtual teacher for all students.

This topic has been chosen since the researcher found no study in the selected topic in Hatadihi area of Kendujhar district & this topic is so relevant for the ongoing situation.

5.2.2 Statement of the Problem

The problem of the present study has been stated as:

“Effectiveness of e-content for teaching chemistry to class IX students in terms of Achievement”

5.2.3 Objectives of the Study

1. To study the effect of Treatment, Gender and their interaction on Achievement in Chemistry of students taught through the e-content and the students taught through the Traditional Method of teaching by taking their pre-test scores of Achievements in Chemistry as covariate.
2. To study the effect of Treatment, Gender and their interaction on Achievement in Chemistry of students taught through the e-content and the

students taught through the Traditional Method of teaching by taking their pre-test scores of Achievements in Chemistry as covariate.

5.2.4 Hypotheses

H₀₁: There is no significant effect of Treatment on Achievement in Chemistry when their pre-test scores of Achievements in Chemistry were taken as covariate.

H₀₂: There is no significant effect of Gender on Achievement in Chemistry when their pre-test scores of Achievements in Chemistry were taken as covariate.

H₀₃: There is no significant interaction of Treatment and Gender on Achievement in Chemistry of students taught through the e-content and the students taught through the Traditional Method of teaching when their pre-test scores of Achievements in Chemistry were taken as covariate.

5.2.5 Design of the Study

A worthwhile research project is likely to result from a formulated research design. The design can be equated to a blue print which provides a clear-cut guideline to the investigator in carrying out his/her research successfully. In the present study, the investigator developed and validated e-content package on Chemistry unit Atomic Structure. To achieve the objectives, the investigator has chosen pre-test post-test control group design. The students of control group were taught by traditional lecture method which includes verbal discourse, chalk and talk and text. The students of experimental group were taught through e-content and the measures were taken to control or minimize the threats to internal and external validity to a reasonable degree.

5.2.6 Sample

In the present study sample of forty IX class students of Odisha Adarsha Vdyalaya, Sundarapal in Hatadihi block of Kendujhar district will be taken using random sampling technique. The final experiment was conducted on forty class IX students belonging to Odisha Adarsha Vidyalaya, Sundarapal, Kendujhar. Of these 20 students were in experimental group and 20 were in control group. There were 11 boys and 9 girls in each group. Thus, the sample

was representative of Gender. The medium of instruction was mixed language (Odia & English).

5.2.7 Tools

E-content was developed by the investigator on the selected topic. The effectiveness of e-content could be observed through the achievement test. The achievement in chemistry was assessed with the help of achievement test developed by the investigator.

Achievement test on Chemistry for IX Standard Students tool was developed by the researcher for the conduct of pre-test and the post-test. Multiple choice items were constructed from the selected content area based on the objectives of teaching of the selected content. Efforts were also made to improve the language of the items and to remove the ambiguity in the items enabling the students to understand the items without difficulty at the first attempt. The constructed items were presented to juries which consist of experts in the field of teaching of chemistry. Based on the expert opinion, the items were edited. Some items were deleted. A rough draft of the tool was prepared and it consists of 20 items. The details regarding preliminary draft of the Achievement test tool given in the Appendix.

5.2.7.1 Preparation of Weightage Tables for The Final Draft of the Achievement Test

After the item analysis, the investigator prepared the final draft of the Criterion test tool and it consists of 20 items. The details regarding the final draft of the Criterion test tool given in Appendix. It clearly, indicates that items in the Achievement Test of Chemistry adequately cover a selection of content covered during the treatment range of complexity in objective levels ranging Knowledge to Application. On the basis of these criteria, the final version of the Achievement Test of Chemistry consisted of 20 items. The reliability and validity of Achievement Test in Chemistry were established.

5.2.7.2 Reliability

Reliability refers to the consistency of measurement over time. Different methods were used to calculate Reliability of Achievement Test in Reliability and validity, for establishing the Reliability, the Achievement Test in Chemistry

was administered on forty students of class IX belonging to Odisha Adarsha Vidyalaya, Sundarapal, Kendujhar, Odisha. Therefore, Achievement Test in Chemistry was considered to be Reliable.

5.2.7.3 Validity

Content Validity is the degree to which the items on a test adequately represent the content of the discipline or field of study. The content validity of the Achievement Test in Chemistry can be established only by judgements regarding the extent to which the test measures what it intended to measure, in other words the extent to which it reflects the content. It involves essentially the systematic examination of content of the Achievement Test in Chemistry to determine whether it covers a representative sample of the concepts to be assessed. Content Validity was determined by inspection of test-items and careful analysis of actual subject matter and instructional objectives against the blueprint of this test.

The Content Validity of the Achievement Test in Chemistry was established by having a discussion with the experts from the field of Chemistry. On the basis of their opinion, the Achievement Test was found to be valid. Thus, the test had Content Validity.

5.2.8 Procedure of Data Collection

The study was experimental in nature and data were collected by conducting experiment involving two groups. One group was designated as the Experimental group and the other as the Control group in this study. Both, the experimental group and control group was taken from Odisha Adarsha Vidyalaya, Sundarapal, Kendujhar, situated in Odisha. The medium of instruction was mixed (English & Odia).

Groups were randomly assigned to the treatment. There were two levels of Treatment. These were teaching chemistry through e-content and traditional method. Both the groups were pre-tested by administering achievement test in Chemistry developed by the investigator to assess the achievement. The pre-test scores on achievement test in Chemistry constituted pre-achievement in Chemistry of class IX students.

The students of experimental group were taught through e-content developed by the investigator. At the end, the achievement test in chemistry was administered again to both the students of Experiment and Control groups in the same way as done at the beginning of the experiment. It constituted the post-test scores on the achievements test in chemistry.

5.2.9 Statistical Techniques used

The statistical techniques used in the present study for analysing the data are given here objective-wise:

1. To study the effectiveness of the e-content in teaching in terms of achievement in chemistry of students. Percentile, Mean and Standard Deviation were used for analysing the data.
2. To study the effect of treatment, gender and their interaction on achievement in chemistry of students by taking pre-test scores of achievements in Chemistry as covariate. 2 X 2 Factorial Design ANCOVA was used for analysing the data.

5.3.0 EDUCATIONAL IMPLICATIONS

The study has demonstrated that e-content on Chemistry (atomic structure) have produced significant positive difference in the achievement on Chemistry of IX Standard students when compared with traditional method of instruction. Therefore, the e-content package can be confidently used as an effective method of learning chemistry by the IX Standard students.

It has been found that e-content method of teaching is more effective than the traditional method of teaching in improving the achievement in teaching of chemistry at XI Standard level irrespective of the subgroups of the sample. Hence, it is assumed that e-content has had an influence on students learning without being distracted by any other biological, social and economic factors. It is found that e-content method of teaching promotes active learning and retention of the content. The method of e-content enhances mastery over the subject. The teachers may be encouraged to produce e-content packages for all units in chemistry. The present study has substantiated the earlier studies on e-content in various subjects and its effectiveness in teaching and learning.

5.4.0 SUGGESTIONS FOR FURTHER RESEARCH

The following suggestions for further research are being put forward keeping in view of the findings of the present study:

The present study as such can be replicated at higher level, polytechnic level, engineering level and at various levels of academic courses.

All units on each subject may be chosen to experiment with e-content package. It can be replicated with other subjects like languages, English, Chemistry, Social science, Commerce, History, Economics and Civics.

The present study was carried out only for a sample of Forty IX Standard students. Further study may be conducted with large sample.

This study was done only for one selected unit for teaching chemistry at IX Standard level. Further investigation may be done for elementary and higher classes.

5.5.0 CONCLUSIONS

From the findings and discussions, it revealed that the treatment that is e-content produced a significant effect on the achievement. Therefore, e-content may be employed for enhancing the Achievement. There is no significant effect of gender on the students' achievement in Chemistry. Therefore, it can be concluded that achievement is independent of the Gender of the students. There is significant Interaction of Treatment and Gender on the students Achievement in Chemistry. Therefore, it can be concluded that Achievement is dependent of the interaction of Treatment and Gender of the students.

Therefore, e-content may be employed for enhancing the Achievement of the students. The teacher should take steps to design interesting and attractive e-contents for teaching and apply those effectively to grasp the minds of students towards subject matter.